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## THE THINKING ANIMALS OF ELBERFELD AND MANNHEIM

OUR period, which has wheedled from Nature so many of her mysteries, which has snatched from her electric waves, the Roentgen rays, and radium; our period, which has stilled the longing of a thousand years by acquiring the bird's flight, has in recent years realized another age-long dream of man. It has taught us to understand the speech of animals, and has thereby accomplished a work in comparison with which all other discoveries, brilliant though they may be, seem to pale. Proof has been given that animals which have lived with humans in most intimate though dumb intercourse can learn our language, and in this language acquaint us of their spiritual lives. They tell us what they understand and what they can learn; what they like and what they do not like; they assure man of their interest and give him advice—and all this not with mere facial expression which might be interpreted to mean this or that, but by the human word, not spoken, to be sure, but written.

We can have intercourse with animals as with absent friends, not by movements of the organs of speech, but by those of the limbs which can present symbols expressing thought. Or, more correctly, as with a man who, through mutilation of a certain part of the brain, has lost the faculty to express the symbols orally, but whose understanding of speech and whose ability to express on paper, by the hand, the symbols of the mentally perceived word, has not been injured.

Again, something exceedingly great, something revolutionary, has been achieved outside of the organized sci-

ences. And like everything new, it must fight the dogma of school and church. One man has already been sacrificed. Held in contempt by scientists, he was sacrificed on the pillory of ridicule.

Long before William von Osten, thousands knew that animals possess some reasoning ability. The observation that a horse makes a wide turn on one side of the street in order to enter the stable door on the other without mishap is only what has been noticed in analogous ways by countless people. But William von Osten was a truly remarkable investigator who did not consider it his mission to observe that which had never before been observed, but to think about common observations that which had never before been thought. Thus he came upon the idea that the animal intelligence might be developed and analyzed, and the very soul of the beast be laid bare. He himself fell in the fight; but his idea was not lost. It was saved by his more fortunate followers, Karl Kroll and Paula Moekel.

There is still suspicion; but so conclusive is the so-far finished work that honest scepticism, which seeks only truth, inspires its completion; and incompetence and envy cannot harm it. Whoever has been to Elberfeld or Mannheim, and with open mind and without prejudice has viewed these wonders, knows that the animals do think as do human beings and can express human thoughts in human language.

The work of Herr Kroll is more difficult than that of Frau Moekel. The horse has a peculiar temperament, different from that of the dog or cat. The horse

is more often unwilling to obey, and when it is unwilling, it is difficult and frequently impossible to bring it to obedience. Often it will give no answer during a demonstration, or will give repeatedly a wrong one. The solution of a problem in addition is, for example, 54. With inexplicable stubbornness, the horse gives the answer 53, and repeats this again and again in spite of all assurance of its error. Finally it yields to scolding and cajolery and changes its answer. It now insists upon 55, but nothing can make the animal say the intermediate and correct number. Is this inability or unwillingness? Herr Kroll says it is perversity, and the whole behavior of the beast proves this. But these are appearances which may mean anything and which may be interpreted variously. Herr Kroll can force us to accept his facts, but not his interpretations. The horses do not appear to express themselves concerning this. Any one, however, who has read Kroll's wonderful book on the thinking beasts, and who has been to Elberfeld, has seen enough to believe everything in the book; and he will know that the horses really have expressed reactions during such an incident. And one who has been to Mannheim has seen how the dog rebels at the solution of a problem with the express statement that it is bored and that it is now the cat's turn; such a one knows that it is really unwillingness. When, for example, the dog Rolf extracts no more algebraic roots, although he has done so a short time before, and tells us that he does not *want* to do so any more, is it perversity or inability? And when Frau Moekel explains why the dog is unwilling: that some time before a professor, in the dog's presence, advised her not to occupy the animal with roots because it was worthless and an epileptic might do

the same; and when Rolf has since declared that the extraction of roots is worthless, is it lack of ability or obstinacy? Have we then any grounds to doubt the explanations and previous description of Kroll?

However, one believes only what one has seen. I shall therefore mention a few examples of my experience in Elberfeld. The horse Hänschen read the number 57 and multiplied the two digits by each other; it solved  $6 + 7$  correctly and multiplied the numbers; it read correctly the number 1,526 and gave the sum of the digits; it raised the numbers 5 and 6 to their fourth powers and read the number 121,121. These were difficult achievements, because the animal had to change the foot with which it expressed itself, since it struck with its right fore-foot for the units, then with the left for the tens, again with the right for hundreds, and with the left for thousands. And problems were given to the horse which no one but myself knew.

The horse Muhamed read the number 87,164 and named, at the word of command, the two digits at the right, multiplied these two, raised the greater to its fourth power, gave the sum of the digits of the number 87,164 on written demand, and added to this the number on a black-board left by accident on the telephone box. The number on the telephone was 5; the sum was therefore 31.

Another horse, Berto, is blind; optical aids cannot exist for him. Every observer can easily assure himself that the beast has an extremely defective lens in each eye. The possibility that it may still have some sensitivity to light cannot be excluded, but optical signals could be understood only by the alternate darkening and lighting of the room, which cannot occur without being detected by the spectators. Berto also calculates

well. He repeats numbers which have been written or struck on his hide or which have been spoken to him, adds, subtracts, multiplies, and divides these numbers, and raises the number 12 to the second power.

As I have said, the horses frequently make mistakes or refuse to answer at all. They give answers more readily and make fewer errors when working with Herr Kroll than with a stranger. They work worse when spectators are present. A very characteristic occurrence was the following: Another gentleman and I were present as spectators when Muhamed was brought in. He was unruly, snorted, and showed his unwillingness by all the expressions at his command. Herr Kroll had the horse led away and asked the spectators to conceal themselves behind a curtain. Muhamed was again led in, but seemed immediately to have detected both eavesdroppers behind the tapestry. He continually turned his eyes in that direction and was even more stubborn than before. He seemed—a four-legged Hamlet—to scout the listeners with unintelligible answers.

One who meets these horses in such a mood, and sees them only once or twice, can easily come to the conclusion that the animals give correct answers only to their master. But the question still remains, whether they cannot or will not. Every longer and more thorough observation leads to the conviction that the animals can work under a stranger as well, and that we must attribute refusal to work to perversity. I have been able to demonstrate the horses' work to two totally strange spectators, Herr Kroll or the groom being present.

At the last international zoölogical conference in Monaco, signed resolutions were passed by the zoölogists, animal-behaviorists, psychologists, and psychia-

trists, which charged the theory of Kroll and his adherents, that it was contrary to mental development, that it was irreconcilable with the theories of scientific neurology and animal psychology, and that it was supported by no exact method or technique. Proof was demanded involving the use of the exact methods of experimental psychology and physiology, methods opposed by those who were openly opponents of Kroll. These charges were unfounded, and the demands, as far as they had any sense, have long been fulfilled.

Countless investigators have tested the horses with utmost skepticism and under the most carefully controlled conditions and have confirmed Kroll's results. However, the horses were not tested by the "exact methods of experimental psychology and physiology." These methods, because of the peculiar conditions, are out of the question. The subjects do not permit the use of any complicated apparatus, and experimental psychology has no method which can be applied to the problems involved. The proceeding cannot be more exactly established and registered by means of the technique of experimental psychology, and to attempt to measure the time-duration of responses would be the height of the unscientific. It is also conjectural just what physiological methods can be used. If we want to give these observations their rightful scientific place, and to unite them to those rigorous laws to which they show clearest connection, then we must before all apply those mental tests which are used upon mentally defective human beings. But these are Kroll's methods. The methods which are employed upon the patient of the psychiatrist are not the less scientific because the procedure of experimental psychology cannot be used, and that of physiology is

out of the question. And as far as "animal psychology" is concerned, whereof do its exact methods consist? Animal psychology, so far as it has dealt with mental phenomena, has employed one method, and that is to connect outward expressions with psychic changes. This method, whose only scientific *raison d'être* was that it was the only available one, Kroll sought to replace by a new one, which would give us a more direct insight into the psychic processes of animals, as it does into those of the human. Truly, to bring the charge of unscientific method against an investigator, whom we must thank for this great methodological advance, is a proceeding which is really of psychological interest.

Herr Kroll, merchant, is in science, if you will, a dilettante; but a dilettante in the noblest and highest sense, as Schopenhauer has said: a man who does not live by his work, but for his work. Whoever reads Kroll's book must admit that the author has pursued his investigation with the greatest conscientiousness, with critical rigor and method, and that his exposition shows a remarkable clarity. The chapter on "clever Hans," an apparently dry recital of facts, is a tour de force of exposition, full of that fine humor such as only a superior spirit can infuse and thus perform an act of justice toward his great predecessor.

One thing, however, is certain, and that is that science has really no right to get on its high horse, where Kroll's animals are concerned, and to flaunt arrogantly the "scientific method." Kroll himself carefully considered the possible variables and with critical examination ruled them out. Can there be a more methodologically perfect idea than to select a blind horse for investigation so as to exclude the variable of optical aid? With this, he has done away with the

only room for doubt to which one could point with a trace of justice. As for olfactory (the blind horse apparently has no sense of smell), auditory, electrical, or even telepathic aids—will any one seriously attempt to doubt these in the face of the published evidence?

I have mentioned that the horses do not always show all their accomplishments. It seems that they are available for only a comparatively short space at a time for these investigations. Von Osten's "clever Hans" did not work at all during the last years of his master's life—because, as von Osten apparently correctly reasoned, it no longer wanted to work. The horse Zarif which, according to Kroll's book and other reports, has shown some fine achievements, is no longer used as a brain worker, but as a riding horse. And Muhamed, too, is on the down grade of mental efficiency. At the last the horses rebel against all human education and exhibit a striking negativity. This state of affairs is highly inconvenient and increases the difficulties of investigation inordinately. But the fact, on the other hand, is most interesting. At first it seems to point to the question of conscious or unconscious aid, and then it presents one of the most fascinating problems, the problem of the will. Are the animals really unwilling, and why are they so? is the question set.

The results at which Frau Moekel has arrived with her dogs point hopefully to the likelihood that we soon may have a deeper insight into the volitional processes of the animal world. The dog Rolf, at Mannheim, is also often perverse. But here we are informed of this by the dog himself, for he speaks more and oftener than the Elberfeld horses. The two places of investigation offer striking contrasts. There the great, passionate beasts, with all the equipment of the

stall and the necessary apparatus; here, more of a drawing-room, smaller, neater, peaceful, and always salon-like; not only the surroundings but the experiment is more elegant, more easily observed, everything clearer and more comprehensible. Here it is more difficult to produce variables and easier to avoid them. The small animal seems never to be in error. Quietly and decisively, it strikes off the numbers which represent letters. I was unable to detect a single mistake during all my stay. When the animal does not want to work any more, he tells us so. Rolf explains that the task is becoming monotonous; he has no more desire for it and suggests that the cat be brought in.

I want to relate a few of my experiences in Mannheim. Rolf, or, as the children (and he himself, too) often call him, Lol, had just received a letter from a gentleman who had visited him a few days previously. Rolf had not yet seen the letter when I arrived, and did not know its contents. Dr. Moekel informed the dog that there was a letter for him and that he might read it. She held the letter before his eyes, and after a few minutes he answered affirmatively to the question whether he had read it. (Two taps of the paw.) The letter read:

"DEAR LOL: I think often of you; how beautifully and obligingly you worked. I told it to our Pick, who does not yet know how to read, talk, or calculate. We also have a dachshund, who is unfortunately ill. Many regards." Signature.

Before my eyes Rolf dictated the answer:

"DEAR: Let Pick come to Mother to learn. Dackel too. Call doctor. Greetings. LOL."\*

\* The dog spells phonetically and omits faintly pronounced vowels—as "dagl" for "Dackel," "lib" for "lieb."

After this he tapped: "No more." He said he was sleepy and had had enough. After a pause, and after he had solved an example, I asked the dog: "Rolf, why have I come here?" He answered: "To see Lol work. Bring in Daisy" (the cat). He wanted to be relieved by the cat. The letter *M* was written upon a paper and the dog asked to construct words beginning with it. He built the words *mouse*, *man*, and *Migl*. Michael was the name of the coal-man. While the dog was busy with this, an automobile passed the house. After he had finished, I asked the dog what he had heard a few minutes before. He answered: "Auto." Then the conversation was turned to the fact that Rolf expected progeny by the bitch Jela. "What is coming soon?" he was asked by Dr. Moekel. Promptly he answered: "Little Rolfs." I asked him my name, and he answered, "Wolf"; and where I came from. He replied: "Basl." Neither name had been mentioned; but the dog seemed to remember that the night before it had been said that some one of that name was coming from Basel the next day. From a number of illustrated cards, which had pictures or letters in various colors on them, I selected one; and without Dr. Moekel, her daughter, who kept the record of the proceedings, or myself knowing what was on it, the card was held before the dog's eyes. To the question whether he knew what was on the card, he answered affirmatively, and then wrote: "Red, blue, green stripes." There were two red, two blue, and two green lines on the card. The same experiment was tried with another card, and again Rolf answered promptly: "B, D, blue, red." There was a blue *B* and a red *D* on the card.

I do not know whether I should believe this had I not myself (with

a somewhat creepy sensation) experienced it.

After I had returned home, I wrote Rolf a letter and asked if he would not give me one of his prospective children. In a few days I received an answer which, to be sure, I had not seen dictated, but which was written in the presence of twenty-seven persons, mostly Mannheim officials of indubitable standing. The letter read:

"DEAR: Lol gives you a little Lol.  
Greetings.                                    YOUR LOL."

As Frau Moekel wrote me, Rolf had answered to the question of who had been there to see him with: "To-day Mr. Wolf was here. Little Red Riding-Hood, too." My name reminded him of the wolf in the fairy tale.

The dog of Mannheim has allowed us to take a more than superficial glance into the mental processes of beasts. Perception and apperception are fully developed, a fact most clearly brought out by the lessons and the answers to the letters. Associative ability is clearly recognizable. The statements that other dogs who are still uneducated should come to Dr. Moekel to be taught, and that a doctor should be brought for the sick Dackel, prove this. The ability to

calculate is most highly developed. The dog does not extract roots any more, but that he did do so I firmly believe, after having seen Frau Moekel and her dog at work. His ability to observe is excellent. We can also point to ethical qualities, as interest in the sick dog.

Frau Moekel had begun her experiments long before she heard of Kroll. Both investigations are therefore independent of each other, and thus each brings to the other a worthy aid and confirmation. If any one still doubted the horses of Kroll, he would be convinced by the dog Rolf.

A new field which cannot be overlooked is opened to our eyes. What will the beasts have to say to us? What thoughts are carried in the head of a beast of prey when his open-mouthed brood surrounds him? Shall we learn what happens to his will when he is caged? Will the lion be granted the ability to tell us also of his suffering? And what do the animals say to one another? And in what language? How dogs converse with each other, Rolf has already told his mistress. The tail, the eyes, the champing jaws are all means of speech. And what shall we discover of the souls of the beasts?

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